

ABSTRACT

An electrode catheter is introduced into a hollow anatomical structure, such as a vein, and is positioned at a treatment site within the structure. Tumescant fluid is injected into the tissue surrounding the treatment site to produce tumescence of the surrounding tissue which then compresses the vein. The solution may include an anesthetic, and may further include a vasoconstrictive drug that shrinks blood vessels. The tumescent swelling in the surrounding tissue causes the hollow anatomical structure to become compressed, thereby exsanguinating the treatment site. Energy is applied by an electrode catheter in apposition with the vein wall to create a heating effect. The heating effect causes the hollow anatomical structure to become molded and durably assume the compressed dimensions caused by the tumescent technique. The electrode catheter can be moved within the structure so as to apply energy to a large section of the hollow anatomic structure. In a further aspect, the location of the electrodes is determined by impedance monitoring. Also, temperature sensors at the treatment site are averaged to determine the site temperature.